LAWRENCE LIVERMORE
REPORT

A weekly collection of scientific and technological achievements from Lawrence Livermore National Laboratory, Sept. 13-17, 2010

Did life on earth come from space?

Protein-building amino acids could have been "shock synthesized" in comets impacting early Earth.

Life on Earth as we know it could be from out of this world.

New research from Laboratory scientists shows that comets that crashed into Earth millions of years ago could have produced amino acids -- the building blocks of life.

Amino acids are critical to life and serve as the building blocks of proteins, which are linear chains of amino acids.

In the Sept. 12 online edition of the journal *Nature Chemistry*, LLNL's Nir Goldman and colleagues found that simple molecules found within comets (such as water, ammonia, methylene and carbon dioxide) just might have been instigators of life on Earth. His team discovered that the sudden compression and heating of cometary ices crashing into Earth can produce complexes resembling the amino acid, glycine.

To read more, go to the Web.

Lab to hire 300 people by end of year

The Lab is hiring at its National Ignition Facility, where 192 lasers converge on hydrogen fuel housed in a tiny gold chamber like the one shown here.

The Lab plans to hire 300 people by the end of the year in the fields of engineering, computing, chemistry, physics and others.

Some of the jobs are in the National Ignition Facility, where scientists will attempt to create fusion energy in the laboratory. Fusion energy is the same energy found in the sun and stars. NIF will begin experiments later this year.

Other jobs will be in high-performance computing -- the Lab has long been a center for supercomputer work. Supercomputers also are being used to study how to defend U.S. networks against terrorist strikes, and the Lab will be hiring for that work, as well.

To read more, go to the Web.

Talking about climate change

Benjamin Santer, one of the Lab's resident experts in climate change.

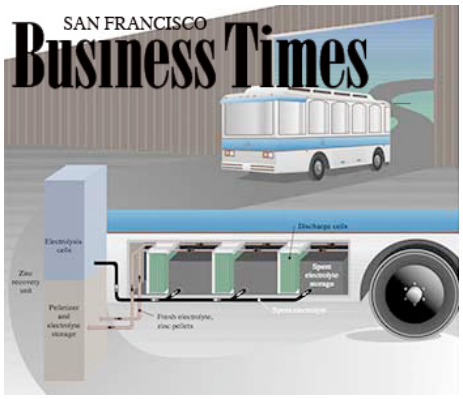
Climate Science Watch recently interviewed the Lab's Benjamin Santer, who discussed what it takes to keep the public aware of climate change and how best to understand it.

Addressing climate change as a societal problem requires a healthy relationship between science and public policy making, grounded in a broad public understanding of its drivers, impacts and solutions, Santer said.

Effective communication of the science behind climate change is more important than ever. Santer discusses how climate scientists communicate complex research findings to the public.

To see the interview, go to http://www.youtube.com/watch?v=IA_Hv97mu6c

Lab licenses zinc air fuel cell



Nearly continuous use of fleet vehicles, such as buses, is possible with 10-minute refueling at 4 to 6 hour intervals, using the process illustrated here.

A zinc air fuel cell developed at the Laboratory that can be used in electric vehicles, particularly those that are in nearly continuous use, has been licensed to a private company.

Zinc Air Inc. of Kalispell, Mont. opted for the Lab-developed fuel cells because standard lithium batteries, which most electric car makers are adapting for their vehicles, are not cost effective for widespread use.

John Cooper, a retired Livermore Lab chemist, developed the zinc air fuel cell technology.

Cooper says this fuel cell technology would work best in fleet vehicles like those used by United Parcel Service Inc., FedEx Corp, and the U.S. Postal Service, because they have widespread support infrastructure that could be converted to charge them.

According to the Lab, a 10-minute refueling would allow about 24 hours of battery use.

To read more, go to the Web.

Clean energy research goes East

Chinese and scientists will collaborate with Lawrence Livermore researchers on clean energy, with millions of dollars in backing by the two nations.

LLNL is part of a U.S. team that will receive $25 million during the next five years from a joint U.S.-China Clean Energy Research Center.

The team, led by West Virginia University, will develop and test new technology for capturing and storing carbon gas, which is considered a main culprit in climate change.

"We believe strongly that cooperation between the United States and China on clean coal and carbon capture and sequestration is critical to national security and global energy and environmental interests," said Julio Friedmann, LLNL's director of the carbon management program.

To read more, go to US/China research on the Web.

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LLNL applies and advances science and technology to help ensure national security and global stability. Through multi-disciplinary research and development, with particular expertise in high-energy-density physics, laser science, high-performance computing and science/engineering at the nanometer/subpicosecond scale, LLNL innovations improve security, meet energy and environmental needs and strengthen U.S. economic competitiveness. The Laboratory also partners with other research institutions, universities and industry to bring the full weight of the nation's science and technology community to bear on solving problems of national importance.

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